

Analysis of Adherence Factors to Tuberculosis Therapy at the PB Selayang II Health Center, Medan City

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Abstract

Pulmonary tuberculosis disease in Indonesia is increasing every year. The percentage of people receiving tuberculosis treatment as of 1 November 2022 is still far below the goal set (90%) or 52%. The 2020-2024 national health development strategy and the national medium term development plan 2020-2024 call for eliminating tuberculosis in Indonesia by 2030. Many factors can affect the success of tuberculosis treatment, including patient factors, drug ingestion monitor factors, and drug factors. This study aimed to determine the factors that influence therapy compliance in tuberculosis patients at the PB Selayang II Public health center, Medan City. This research method is quantitative analytical with a cross-sectional research design. The research was conducted at the PB Selayang II Public health center, Medan City, which was carried out from May to June 2023. The population in the study was all 109 tuberculosis patients. The sampling technique was purposive sampling, so the sample for this study was 56 patients. Data collection uses questionnaires with interviews. Data analysis using bivariate analysis using the chi-square test. The results of this study show that internal factors, namely taking anti-tuberculosis drugs, are related to compliance with a sig value of 0.002 and external factors, namely the role of officers and motivation, are related to compliance with tuberculosis therapy at PB Selayang II Public health center with a sig value of 0.000. The conclusion from the results obtained that significantly influences compliance with tuberculosis therapy is external factors where there are 2 categories related to compliance, namely motivation and the role of officers.

Keywords: External factors, Internal factors, Public health center, Tuberculosis, Treatment compliance

INTRODUCTION

In order to carry out countermeasures effectively and efficiently, prevention, control and eradication efforts must be carried out. Infectious diseases are currently the most serious health problems facing the general public, causing various illnesses such as disability and even death. One of the most dangerous and most common infectious diseases today is Tuberculosis (Kemenkes RI, 2019).

According to the World Health Organization, in 2020 it is predicted that 10 million people worldwide will be infected with tuberculosis, 5.6 million of whom consist of men, 3.3 million women, and 1.1 million children. child. The largest number of newly diagnosed tuberculosis cases, 43%, occurred in Southeast Asia, followed by Africa with a percentage of 25% and finally, the West Pacific with many 18%. Every country and every age group has tuberculosis sufferers. Tuberculosis can be cured and can also be prevented. Tuberculosis is an infectious disease that can cause the largest number of deaths in the world, ranking second after COVID-19 (WHO, 2020).

The Global Tuberculosis Report reports that the estimated number of people diagnosed with tuberculosis worldwide in 2021 will reach 10.6 million cases, or around 600,000 cases, which is an increase from the previous year, namely 2020. Of the 10.6 million cases referred to, there were 6.4 million 60.3% people who have been diagnosed and are entering treatment, and 4.2 million (39.7%) people who have not been evaluated, diagnosed, or treated. Among them, there are 6 million men affected by cases, 3.4 million women and 1.2 million children. Deaths caused by tuberculosis can be said to be quite high overall. Around 1.6 million people died due to tuberculosis, this shows an increase in the number of deaths from the previous year which amounted to 1.3 million people. And there were also around 187 thousand people who died from tuberculosis–HIV (WHO, 2022).

The prevalence of tuberculosis in Indonesia is ranked 2nd in the world in 2021, where the number of tuberculosis sufferers is first in India, then Indonesia, China, the Philippines and Pakistan, this is the order of the top 5 countries with the most tuberculosis sufferers in the world. In the previous year, Indonesia entered 3rd place with the largest number of tuberculosis sufferers. In 2021, the number of tuberculosis cases in Indonesia is estimated to be around 969 thousand, which is an increase of around 17% from the previous year which amounted to 824 thousand people. Around 28 thousand people with drug-resistant tuberculosis, 144 thousand deaths due to tuberculosis and around 86% success in treatment (WHO, 2022).

In 2021, the number of tuberculosis cases in Indonesia is estimated to be around 969 thousand, an increase of around 17% from the previous year, which amounted to 824 thousand people. Around 28 thousand people with drug-resistant tuberculosis, 144 thousand deaths due to tuberculosis and around 86% success in treatment (WHO, 2022).

North Sumatra has the largest number of tuberculosis cases in 2021, ranking 6th after West Java, Central Java, East Java, DKI Jakarta, Banten, and North Sumatra. In 2020, the worst cases of tuberculosis were found in Medan City, Deli Serdang, and Simalungun with the results of acid-resistant bacilli (+). In addition, in 2021, the number of tuberculosis cases in Medan City has now exceeded 10% (around 1,000 cases), with a predetermined target of around 18 thousand cases (Kemenkes RI, 2021; Damanik et al., 2023)

The first step in efforts to control tuberculosis is the application of treatment. The indicators that will be used in evaluating the success of the implementation of tuberculosis treatment control are national *or Case Detection Rate,* and the success rate of treatment or Success Rate is formed from the cure rate and complete treatment rate (Fitri et al., 2018). In Indonesia, the success rate of treatment in 2014 was around 85.1% and increased to 85.8% in 2015, 85% in 2016, and 85.1% in 2017. WHO maintains a standard treatment success rate of about 85% (Triningsih et al., 2019).

The success of tuberculosis treatment requires adherence, and adherence is a very important factor in this tuberculosis treatment method. Adherence is the degree to which a person acts correctly on the advice of health or medical personnel and helps describe the use of a drug according to the instructions in the prescription. It includes its use promptly. The most effective method to treat tuberculosis is to take medication as recommended by a doctor and follow the prescribed therapy until it is declared successful and negative acid-resistant bacilli (Yulisetyaningrum et al., 2019). One of the influencing factors in the treatment of tuberculosis is the distance from home to health services, transportation costs, the amount of drugs consumed, and support from the patient's family.

In addition, treatment success is also influenced by sufficient stocks of anti-tuberculosis drugs in the health centre, as well as support from family and drug swallowing supervisors who are indispensable in the success of this treatment so that complete treatment produces a cure for tuberculosis patients (Damanik et al., 2023; Filipus et al., 2020). According to Fitri (2018) 2 factors affect tuberculosis compliance, namely internal factors and external factors.

Internal factors are factors that reside within oneself. These factors include gender, age, education, income, occupation, and knowledge. External factors are external factors that include the role of drug swallowing supervisors, access to health services, side effects of anti-tuberculosis drugs, the role of health workers, and motivation both from oneself and support from family.

The action of government health services to the community is close to the role of the Public Health Centre. In Indonesia, Public Health Centre is the first step in the first stage of health service delivery. Public Health Center, often known as Public Health Centres, is the initial stage or first step in providing health services for the community because it is very effective in providing first aid to the community with health standards.

METHODS

This research is a quantitative analytical research with a cross-sectional research design. This research aims to determine compliance factors with tuberculosis therapy at the PB Selayang II Public Health Center, Medan City.

This research was carried out by the PB Selayang II Public Health Center, Medan City, which was carried out from May to June 2023.

The population in this study was all patients suffering from tuberculosis at PB Selayang II Health Center, Medan City, totalling 109 patients. The sampling technique in this research was purposive sampling, which was used to collect samples. Patients who met the inclusion

criteria comprised the sample in this study. The inclusion criteria were that Respondents had the status of tuberculosis patients at UPT. PB Selayang II Public Health Center. Patients who have taken anti-tuberculosis drugs for at least 2 months.

From sample calculations, the sample in this study was 56 patients. Data collecby tion in this research used a questionnaire the researcher had prepared in the form of questions.

The research questionnaire was tested for validity and reliability on 30 respondents at different health centres. The location for validating the questionnaire was at the Teladan Public health center, Jalan Sisingamangaraja, Medan City, distributing the questionnaire and then testing the validity of the statement items using the Pearson Product Moment correlation technique. The statement item is declared valid if the calculated r-value> the table r-value, where the table r for N = 30 is 0.361 with a confidence level of 95%. From the validity test results, 22 statement items were declared invalid because they have a value <0.361, and there are 53 items. The statement is declared valid because it has a value >0.361. Reliability testing is carried out to determine the extent of the consistency of a measuring instrument, whether it is reliable or not, using Cronbach's Alpha. If Cronbach's Alpha reliability testing is >0.60, then the instrument being tested can be said to be reliable.

The type of data in this research consists of primary data and secondary data. Primary data was obtained through research questionnaires and interviews with respondents. Meanwhile, primary data was obtained from the PB Selayang II Public health center as medical record data from patients suffering from tuberculosis.

The variables in this study are internal variables consisting of age, gender, education, employment, income, tuberculosis diagnosis and taking anti-tuberculosis drugs. Meanwhile, external variables consist of knowledge, side effects, the role of health workers, motivation, access to services and compliance with taking medication.

This analysis was done using bivariate analysis using the Statistical Program for Social Science (SPSS) software version 20. Analysis of this research data used the Chi-Square test. The Chi-Square test determines whether there is a relationship between each internal and external group and patient compliance. The relationship is significant if the significance value is p<0.05, which means there is a relationship between internal and external factors and patient compliance (Hilda, 2016).

The Health Research Ethics Commission approved this study for the Medan Ministry of Health's Health Polytechnic with the following number: 201.0843/KEPK/Politeknik Kesehatan Kementerian Kesehatan Medan 2023.

RESULTS

Analysis of the Relationship of Internal Factors with Compliance

Table 1. Relationship of Internal Factors to Tuberculosis Therapy at the PB Selayang II Public Health Center, Medan City

Variable	Compliance				Total	P-value
	Disobedient		Obedient			
	n	%	n	%		
Age						
Infant <1 year	0	0	0	0	0	0,361
Toddlers 1-5 years	1	50	1	50,0	2	
Children 6-12 years	0	0	1	100	1	
Teenagers 12-18 years	2	33,3	4	66,6	6	
Adults 18-65 years	23	56,1	18	43,9	41	
Senior >65 years old	5	83,3	1	16,7	6	
Sex						
Male	19	59,4	13	40,6	32	0,485
Female	12	50	12	50,0	24	
Education						
No School	1	25	3	75,0	4	0,295
Elementary school and first secondary school	11	73,2	4	26,7	15	
Upper secondary school or vocational	14	51,9	13	48,1	27	
Bachelor	5	50	5	95,0	10	
Work						
Not working or housewife	9	56,3	7	43,7	16	0,996
Student or College Student	3	50,0	3	50	6	
Government	1	50,0	1	50	2	
Employees self-employed	16	57,1	12	42,9	28	
Private Employees	2	50,0	2	50	4	
Income						
No Income	0	0	18	100	18	0,153
Rp. <1 Million	0	0	6	100	6	
Rp. 1-3 Million	3	16,7	15	83,3	18	
Rp. 3-5 Million	0	0	7	100	7	
Rp. >5 Million	0	0	7	100	7	
Diagnose						
New Tuberculosis	27	55,1	22	44,9	49	0,919
Tuberculosis Relapse	4	57,1	3	42,9	7	
Taking anti-tuberculosis drugs						
2 times	3	42,9	4	57,1	7	0,002
3 times	3	60,0	2	40,0	5	
4 times	2	50,0	2	50,0	4	
5 times	3	23,1	10	76,9	13	
6 times	3	33,3	6	66,7	9	
>6 times	17	94,4	1	5,6	30	

From Table 1. statistical data shows that P = 0.361 (P>0.05) there is no relationship between age and compliance. In the tabulation, results of non-adherent patients were largest in the adult group (18-65 years) with 23 patients (56.1%) and the largest number of adherent patients in the adult group (18-65 years) with 18 patients (43.9%).

From the results of statistical test analysis obtained P value = 0.485 (P>0.05) it can be concluded that there is no relationship between sex and compliance. The results showed that the largest non-adherent patients were male, with 19 patients (59.4%). This was because many

men were non-compliant in treatment due to the amount of activity outside long enough, and the level of laziness in drug consumption also affected patient non-compliance and the largest adherence of patients in the male sex with 12 patients (40.6%) the results of male and female sex only differed slightly, Behind the existence of non-compliant patients, there are also some obedient patients, this is due to the large number of them who want to recover because they think about their family conditions so as not to have an impact on their families.

This statistical data show P = 0.295 (P = >0.05) that education has no relationship with compliance. This is according to research (Nuraini, 2015) and (Kondoy et al., 2014) that there is no relationship between education and compliance. The data showed that non-compliant patients were the largest in high school or vocational education, with 14 patients (51.9%), and the largest compliant patients in high school or vocational education with 13 (48.1%).

From the tabulation results of non-working or homemakers, around 7 patients (43.7%) were compliant and 9 patients (56.3%) had a disability, then students or students who were obedient, there were 3 patients (50%) and non-compliant there were 3 patients (50%), then civil servants there was 1 patient (50%) who was obedient and 1 patient (50%) who was non-compliant, Furthermore, in self-employed jobs, there were 12 patients (42.9%) who were compliant and 16 patients (57.1%) who had a disability. Finally, in private employee jobs, there were 2 patients (50%) who were compliant and those who were non-compliant there were 2 patients (50%). Based on the tabulation results P = 0.996 (P = >0.05) that, there is no relationship between work and adherence to tuberculosis treatment therapy in UPT. PB Selayang II Health Center. This is by several other studies such as (Ruditya, 2015; Kondoy et al., 2014). However, it is not by the research Nuraini (2015) which states that the work affects and relates to compliance.

When viewed from the tabulation results P = 0.153 (P = >0.05), it is stated that there is no relationship between income and adherence to tuberculosis treatment therapy in UPT. PB Selayang II Health Center. This is according to research (Kondoy et al., 2014; Ruditya, 2015), which states that there is no relationship between income and compliance.

When viewed from the tabulation results, it is stated that there is no relationship between the patient's diagnosis and adherence to tuberculosis treatment therapy in UPT. PB Selayang II Health Center.

From the tabulation results, it showed that if the taking of anti-tuberculosis drugs 2 times there were 4 patients (57.1%) who were compliant, and 3 patients (42.9%) who were not compliant. Then at taking anti-tuberculosis drugs 3 times there were 2 patients (40%) who were compliant, and 3 patients (60%) who were not compliant. Then taking anti-tuberculosis drugs

4 times there were 2 patients (50%) who were compliant and 2 patients (50%) who were not compliant, taking anti-tuberculosis drugs there were 10 patients (76.9%) who were compliant and 3 patients (23.1%) who were not compliant, taking anti-tuberculosis drugs 6 times there were 6 patients (66.7%) who were compliant and 3 patients (33.3%) who were not compliant. And at the taking of anti-tuberculosis drugs >6 times there was 1 patient (5.6%) who was compliant and 17 patients (94.4%) who were not adherent. When viewed from the results of the tabulation, it is concluded that there is a relationship between taking anti-tuberculosis drugs and compliance because we can see whether someone is obedient or not from taking the drug.

Table 2. Relationship of External Factors to Tuberculosis Therapy at the PB Selayang II Public Health Center, Medan City

Variabel	Compliance				Total	P-value
	Disobedient		Obedient			
	n	%	n	%		
Knowledge						
Bad	7	53,8	6	46,2	13	0,900
Good	24	55,8	19	24,0	43	
Side Effects						
Light	24	54,5	20	45,5	44	0,815
Heavy	7	58,3	5	41,7	12	
Officer Role						
Bad	18	100	0	0	18	0,000
Good	13	34,2	25	65,8	38	
Motivation						
Bad	15	93,8	1	6,3	16	0,000
Good	16	40,0	24	60,0	40	
Service Access						
Bad	1	50,0	1	50,0	2	0,887
Good	30	55,6	24	44,4	4	

From the tabulation results in Table 2, it can be seen that of the 56 patients studied, the majority of patients with good knowledge were 24 patients (55.8%) with non-adherent categories and 19 patients (24%) with adherent categories. The result value p = 0.900 (p > 0.05), which means that there is no relationship between knowledge and adherence to tuberculosis treatment therapy in UPT. PB Selayang II Health Center.

Based on the tabulation results of statistical tests in Table 4.11, it was found that there were 20 patients with mild side effects in the adherent category and 24 patients (54.5%) in the non-compliance category. Then, patients with severe side effects in the adherent category were 5 patients (41.7%) and those with non-compliance 7 patients (58.3%). The tabulation results stated that the value of p = 0.815 (p > 0.05) which means that it does not have a significant relationship with compliance in tuberculosis treatment therapy in UPT. PB Selayang II Health Center.

From the tabulation results of statistical tests, it was found that the role of good officers in the compliant category was 25 patients (65.8%) and in the non-compliant category, there

were 13 patients (34.2%). The role of officers could be better in the obedient category there are 0 patients (0%) and with the non-compliant category, there are 18 patients (100%). From the data results, a value of $p = 0.000$ ($p < 0.05$) was obtained, which means that it has a significant relationship between the role of health workers and compliance in tuberculosis treatment therapy in UPT. PB Selayang II Health Center.

Based on the results of statistical tests, it was found that there were 24 patients with good motivation in the adherent category and 16 patients in the non-compliance category (40%). Then with bad motivation in the non-compliance category (93.8%) and with 1 patient adherent category (6.3%). The data results stated the value of $p = 0.000$ ($p < 0.05$), which means that there is a relationship between motivation and adherence to tuberculosis treatment therapy in UPT. PB Selayang II Health Center.

Statistical test results were obtained that patients who stated access to good services with the adherent category amounted to 24 patients (44.4%), and with the non-compliance category 30 patients (55.6%). Then in access to services that could be better with the category of compliant and non-compliant have the same number of patients, namely 1 patient (50%). The results of this data stated that the value of $p = 0.887$ ($p > 0.05$) which means that there is no relationship between access to services and adherence to tuberculosis treatment therapy in UPT. PB Selayang II Health Center.

DISCUSSION

The results explained that most of the respondents affected by tuberculosis were adults aged 18-65 years with 41 patients (73.2%), male with 32 patients (57.1%), with high school or vocational education totalling 27 patients (48.2%), who worked as self-employed with 28 patients (50%), with income of Rp.1 million-3 million and non-income who had the same number of patients of 18 patients (32.1%), who were diagnosed in 49 new tuberculosis patients (87.5%) and 18 patients (32.1%) took anti-tuberculosis drugs >6 times.

The results of this study stated that knowledge was not related to compliance because the value of $p > 0.05$ which is $p = 0,900$. This is in accordance with the research Sari et al., (2017), which stated no association between knowledge and adherence to tuberculosis treatment therapy with results $P = 0.619$ ($p > 0.05$), but different in studies Kondoy et al., (2014) which states the relationship between knowledge and compliance with the results $p = 000$ ($p < 0.05$).

This is due to good patient knowledge so there is no relationship with adherence to tuberculosis treatment therapy in UPT. PB Selayang II Health Center. The largest non-adherent

patients at the level of good knowledge with 24 patients (55.8%) and in the largest adherent patients in the well-informed patients with 19 patients (24%) differed only slightly between non-compliant patients and adherent patients. Good knowledge will not necessarily be obedient in taking good and correct medicine, but there are some patients with good knowledge who are obedient in treatment. The reason they do not comply is because they know about tuberculosis but they ignore this treatment.

The results of the study on side effects stated that there was no relationship between side effects and adherence, with results obtained $p = 0.815$ ($p > 0.815$), this is in line with research Kondoy et al., (2014) which stated no association between adverse events and compliance with the results $p = 0.460$ ($p > 0.05$). Based on my observations in the field, most did not feel side effects or mild side effects where there were 44 patients (78.57%), patients stated that they did not experience side effects, at least only some side effects were only felt. Nonadherent patients were largest in patients with mild side effects with 24 patients (54.5%) and adherent patients were largest in mild side effects with 20 patients (45.5%).

The results of research on the role of officers stated that there was a relationship with compliance, with results obtained $p = 0.000$ ($p < 0.005$). These results are in line with research Wulandini et al., (2020) which states that there is a relationship between the role of health workers and compliance where the value of $p = 0.000$ ($p < 0.005$), and this study is also in line with Netty et al., (2018) which states that there is a relationship between the role of health workers and compliance with a value of $p = 0.001$ ($p < 0.05$).

The largest non-compliant patients with the category of bad officer roles with 18 patients (100%) and the largest compliant patients with the category of good officer roles with 25 patients (65.8%) this is due to the presence of non-compliant patients because of the fierce role of officers in treatment services, but obedient patients do not affect the role of officers who are fierce or not, UPT patients. PB Selayang II Health Center said that "the role of officers is very important because if there is no role of officers who remind me in taking medicine and how to take medicine correctly, even though the officers are fierce here, but this is for my good also in medicine," said one of the patients.

This is according to the research based (Sari et al., 2017) states that there is no relationship between knowledge and compliance, but this is different in research (Mamahit et al., 2019) which states that there is a relationship between knowledge and adherence to tuberculosis treatment therapy.

The results of research on motivation stated that there was a relationship with compliance with the value of $p = 0.000$ ($p < 0.05$). These results are in line with research Jaelani

et al., (2021) which states that there is a relationship between the role of health workers and compliance, obtained a value of $p = 0.00$ ($p < 0.05$). In tuberculosis patients in UPT. PB Selayang II Health Center has good motivation with the compliance category there are 24 patients (60%) and with the non-compliance category 16 patients (40%).

According to Niven in Jaelani et al., (2021), Compliance with tuberculosis patients to treatment is very influential with the motivation to maintain their health so that there is a movement to do treatment. This states that motivation can affect patient compliance, judging from the results of the largest number of 24 patients (60%) with good categories or who feel motivated, many patients need more motivation or support from their own families.

The role of health workers has an important role in improving the maximum quality of health services to the community, so it is very helpful in improving the healing process for Pulmonary Tuberculosis sufferers, especially compliance in taking Pulmonary Tuberculosis medication. (Herawati et al., 2020).

Research Hamdana et al., (2023) There is a significant relationship between the role of health workers and compliance with treatment for Tuberculosis sufferers at the Directly Observed Treatment Shortcourse Tuberculosis Clinic, Sinjai Regional General Hospital. The role of health workers in serving pulmonary tuberculosis patients is expected to be able to build good relationships with patients. Elements of the performance of health workers have an influence on the quality of health services, including health services for pulmonary tuberculosis patients, which directly or indirectly will influence the regularity of patient treatment, which ultimately also determines the results of treatment.

Encouragement by health workers is a support system for patients by providing assistance in the form of information or advice, concrete actions that have emotional benefits so that patients feel comfortable, feel cared for, empathize, feel accepted and have attention. The role of health workers who provide health services to the community is to improve the level of public health (Rumimpunu et al., 2018).

The family plays a very important role in providing social support to patients. Social support is grouped into 4 functions, namely structural, functional, emotional and mixed. This has a positive impact regarding family support which provides support for families who suffer from pulmonary tuberculosis (Siallagan et al., 2023).

According to research Mantovani et al., (2022) Family support can support regular treatment of pulmonary tuberculosis sufferers. The better the support provided by the family, including emotional, respectful, informative and instrumental support, the more compliant Pulmonary Tuberculosis patients will be in taking medication (Hamidah et al., 2020). The

support of family members in monitoring the patient's compliance with taking medication can increase the patient's motivation to be more compliant in taking their medication (Mulidan et al., 2021; Haryanik et al., 2023)

Jannah et al., (2022) stated that there is a relationship between family support and adherence to taking medication in pulmonary tuberculosis patients. The biggest motivation comes from the support of the families of Pulmonary Tuberculosis patients. Family support provided by family members can be in the form of informational support, namely explaining information about the disease the patient is suffering from, assessment support such as providing motivation and support so that they do not give up and give up during treatment. Family support can also be provided through instrumental and emotional support in the form of providing daily needs and paying attention to the patient's condition.

The results of the study on access to health services stated that there was no relationship with compliance with the results obtained $p = 0.887$ ($p > 0.887$) this is because patients use private vehicle transportation to carry out treatment at the PB Selayang II Health Center so that there is no difficulty in accessing health services to compliance with taking anti-tuberculosis drugs. From the results of the study, it stated that patient non-compliance due to long drug taking made patients like to be lazy to come to the puskesmas judging from the results of filling out the questionnaire, but the work system at the PB Selayang II Health Center was very fast so that many patients were obedient to tuberculosis therapy treatment.

CONCLUSIONS

The conclusion of this study is that there is a relationship between motivation factors and the role of officers with compliance with a significance value of 0.000, this is because the motivation and role of officers have a major influence on tuberculosis patients during treatment. From the results obtained, external factors that are sufficient to affect tuberculosis therapy adherence where there are 2 categories related to compliance, namely the role of officers and motivation.

Family support and encouragement from health workers are related to compliance with treatment for pulmonary tuberculosis sufferers. It is recommended that health workers provide health education in the form of complete information to patients about tuberculosis, treatment, and the importance of undergoing therapy until completion. It is recommended that families motivate and encourage patients to undergo treatment with discipline and help patients remember to take medication regularly.

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